

## CLAIMS:

1. A device for mapping the distribution of an XRF marker (16) in a body volume (14), comprising:
  - an X-ray source (10) for the emission of a beam of rays (12), said beam comprising a first ray component ( $I_1$ ) with a quantum energy above the K-edge of the XRF marker and a second ray component ( $I_2$ ) with a quantum energy below the K-edge of the marker;
  - a detector (30) for the detection of secondary radiation from the body volume (14), said detector being located outside the beam of rays (12) of the X-ray source (10);
  - means (22) for adjusting the intensity ratio between the first and second ray components in the beam of rays (12).
2. A device as claimed in claim 1, characterized in that the means for adjusting the intensity ratio include a filter (22) removably located in the beam of rays (12).
3. A device as claimed in claim 2, characterized in that the filter (22) contains the material of the XRF marker or is made there from.
4. A device as claimed in claim 1, characterized in that the first ray component ( $I_1$ ) and/or the second ray component ( $I_2$ ) are/is monochromatic or quasi-monochromatic, the quantum energy of the ray component deviating by less than 10%, preferably by less than 3%, from the K-edge of the XRF marker.
5. A device as claimed in claim 1, characterized in that the first ray component is represented by the  $K_{\alpha 1}$ -line and the second ray component is represented by the  $K_{\alpha 2}$ -line of an element.
6. A device as claimed in claim 1, characterized in that the detector (30) is capable of the location-resolved and/or energy-resolved measurement of the secondary radiation.

7. A device as claimed in claim 1, characterized in that it comprises a further detector (20) located in the beam of rays (12) and capable of the location-resolved measurement of transmission radiation through the body volume (14).

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8. A device as claimed in claim 1, characterized in that its components are coupled to one another and together capable of pivoting about an axis of rotation.

9. A method for determining the distribution of an XRF marker (16) in a body volume (14), comprising the following steps:

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a) Irradiation of the body volume (14) with a beam of rays (12) with a first ray component ( $I_1$ ) with a quantum energy above the K-edge and a second ray component ( $I_2$ ) with a quantum energy below the K-edge of the XRF marker;

b) Measurement of the resulting first secondary radiation from the body volume (14);

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c) Irradiation of the body volume (14) with the beam of rays with a different intensity ratio between the first and second ray components;

d) Measurement of the resulting second secondary radiation from the body volume (14);

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e) Determination of those components of the secondary radiation which are due to the fluorescence of the XRF marker by comparing the first and second secondary radiations.

10. A method as claimed in claim 9, characterized in that the secondary radiation is measured at a point where only backscatter is detected, and in that at least one of the spectra of the secondary radiations is determined by approximation by means of a function.

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